

Applicants: CHOU, Tsung Kuan Allen, et al.
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REMARKS

Applicants respectfully request reconsideration of the above-identified application in view of the following remarks.

Status of Claims

Claims 5-8, 11-13, 15 and 18-24 are pending in this application. Claims 8, 11, and 21 have been amended. It is respectfully submitted that no new matter has been added.

Claim Rejections

35 U.S.C. § 102 Rejections

On pages 3-5 of the Office Action, the Examiner rejected Claims 6-8, and 11-13 under 35 U.S.C. § 102(e) as being anticipated by DeReus (US Patent No. 6,876,482). Applicants respectfully request the withdrawal of the rejection of Claims 6-8 and 11-13 under 35 U.S.C. § 102(e) in view of the foregoing amendments and the remarks that follow.

Amended Claims 8 and 11 include a contact switch comprising "a bottom electrode structure including a bottom actuation electrode ... a top electrode structure comprising ... a generally rigid top actuation electrode ... a non-rigid support beam operably attached to said bottom electrode structure to support said top actuation electrode ... and a non-rigid contact beam attached to said top actuation electrode and distal from said support beam ... wherein a spring constant of said contact beam is bigger than a spring constant of said support beam." It is respectfully submitted that DeReus does not teach a switch having this structure or this difference in spring constants.

DeReus teaches a tri-layered beam 108 which is comprised of a topmost electrode interconnect layer 122, a middle structural dielectric layer 112, and a bottommost movable electrode layer 114. In Col. 8, Lines 42-43, DeReus teaches that "Beam 108 is fixedly attached at one end to a mount 110." DeReus teaches in Figs. 1-2 that beam 108 is attached to mount 110 by means of structural dielectric layer 112. This is most clearly

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shown in Fig. 2 of DeReus, because conductive line 136 cannot be mistaken as outlining an additional part of beam 108 which attaches to mount 110. As can be seen in Fig. 1 of DeReus, structural dielectric layer 112 has a length equal to distance 'c' 142 and extends from mount 110 to beyond movable electrical contact 120. Structural dielectric layer 112 is contiguous throughout its length and is not broken up by interconnect vias 126 and 130. This is most clearly shown in Fig. 4 of DeReus where interconnect vias 126 and 130 are shown as occupying a small area in the middle of structural dielectric layer 112 without making this layer discontinuous. Thus, it is the same structural dielectric layer 112 that exists throughout the middle of beam 108 and serves the purpose of connecting the beam to mount 110 as well as supporting and extending beyond movable electrical contact 120.

The Examiner has stated that the claimed "support beam" is taught in DeReus as being "near 122, the section of beam 108 connected to anchor 110" and that the claimed "contact beam" is taught in DeReus as being structural dielectric layer 112. It is respectfully submitted that structural dielectric layer 112 cannot be the claimed "contact beam" because the contact beam is claimed as being "attached to said top actuation electrode and distal from said support beam". However, structural dielectric layer 112 is not distal from the support beam of DeReus which is "near 122, the section of beam 108 connected to anchor 110".

Furthermore, it is respectfully submitted that the support beam of DeReus which is "near 122, the section of beam 108 connected to anchor 110" is, instead, structural dielectric layer 112 because no other part of beam 108 is anchored to mount 110 as mentioned previously. Because structural dielectric layer 112 is a single contiguous layer, without teachings to the contrary by DeReus, it can only be assumed that structural dielectric layer 112 is comprised of a single material with a single spring constant. Therefore, structural layer 112 cannot be both the claimed "support beam" and the claimed "contact beam" because it is claimed that "a spring constant of said contact beam is bigger than a spring constant of a support beam". Therefore, for all of the aforementioned reasons, it is respectfully submitted that DeReus does not teach both the claimed "support beam" and "contact beam" in which "a spring constant of said contact

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beam is bigger than a spring constant of a support beam".

It is therefore respectfully submitted that amended Claims 8 and 11 are not anticipated by DeReus. Each of Claims 6-7 and 12-13 depends from one of amended, independent Claims 8 and 11 respectively and are therefore likewise patentable. The rejection of Claims 6-8 and 11-13 under 35 U.S.C. § 102(e) is therefore requested to be withdrawn.

35 U.S.C. § 103 Rejections

On pages 5-9 of the Office Action, the Examiner rejected Claims 5 and 15 under 35 U.S.C. § 103(a) as being unpatentable over DeReus in view of Dickens et al. (US Patent No. 6,657,525), Claims 18-20 under 35 U.S.C. § 103(a) as being unpatentable over Dickens et al., Claims 21-22 under 35 U.S.C. § 103(a) as being unpatentable over Wheeler et al. (US Patent Publication No. 2003/0025580) in view of DeReus, Claim 23 under 35 U.S.C. § 103(a) as being unpatentable over DeReus, and Claim 24 under 35 U.S.C. § 103(a) as being unpatentable over Wheeler et al. in view of Dickens et al. Applicants respectfully traverse the rejections of Claims 5, 15, and 18-24 under 35 U.S.C. § 103(a).

Each of Claims 5 and 15 depends from one of amended, independent Claims 8 and 11 which as discussed above are allowable over DeReus. It is respectfully submitted that the addition of the teaching of Dickens et al. does not cure the deficiencies of DeReus. Therefore, it is submitted that Claims 5 and 15 are patentable over Dickens et al.

Claim 20 includes "a contact switch comprising top and bottom electrode structures ... wherein a contact force of at least 100 micro-Newton's is maintained between said first and second electrical contacts in response to an actuation voltage of less than 40 Volts between said top and bottom structures."

In Col. 6 Line 58 to Col. 7 Line 8, Dickens teaches that "When the voltage (and therefore the force) is sufficient, the bridge structure will snap down and make contact with the RF conductor(s) ... To increase the speed with which the closing action takes place, the applied control voltage may be increased ... If the voltage is further increased,

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the force may be sufficient to bend the bridge structure to short out the control electrodes." Thus, Dickens teaches a general rule that increasing voltage results in greater force between the electrodes. Applicants however claim an improved contact switch with the property that a "contact force of at least 100 micro-Newton's is maintained between said first and second electrical contacts in response to an actuation voltage of less than 40 Volts". It is respectfully submitted that such properties are not inherent and are unachievable in the prior art. Furthermore, Dickens does not teach or suggest these values or how building a contact switch that includes these properties might be achieved. For the foregoing reasons, Claim 20 and Claims 18-19 dependent therefrom are patentable over Dickens et al.

Amended Claim 21 includes a contact switch comprising "a bottom electrode structure including a bottom actuation electrode ... a top electrode structure comprising ... a generally rigid top actuation electrode ... a non-rigid support beam operably attached to said bottom electrode structure to support said top actuation electrode ... and a non-rigid contact beam attached to said top actuation electrode and distal from said support beam ... wherein a spring constant of said contact beam is bigger than a spring constant of said support beam." As discussed above in reference to amended Claims 8 and 11, DeReus does not teach or make obvious these features. It is respectfully submitted that amended Claim 21 is not taught or fairly suggested by any combination of the teachings of DeReus, Dickens et al., and Wheeler et al. Therefore, it is respectfully submitted that amended Claim 21 and Claims 22-24 dependent therefrom are patentable over DeReus, Dickens et al., and Wheeler et al.

In view of foregoing remarks, Applicants respectfully request that the Examiner withdraw the rejection of Claims 5, 15, and 18-24 under 35 U.S.C. § 103(a).

CONCLUSION

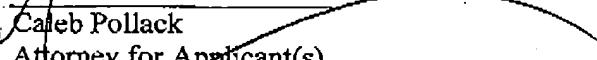
In view of the foregoing amendments and remarks, Applicants submit that the pending claims distinguish over the prior art of record and are in condition for allowance. Favorable consideration and passage to issue are therefore respectfully requested.

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The Examiner is invited to telephone the undersigned counsel to discuss any further issues yet to be resolved in connection with this application.

Except for the fees for the RCE and Petition Extension of Time, being paid separately, no fees are believed to be due in connection with this paper. If any such fees are due, please charge such fees to deposit account No. 50-3355.

Respectfully submitted,


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